



The Physicochemical Properties of Dendeng from Rejected Laying Hens Meat with Giving Basil Leaves

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ABSTRACT

This study aims to determine and evaluate the effect of basil leaf extract (*Ocimum basilicum* L) on the physicochemical properties of dendeng made from rejected laying hens meat. Rejected laying hen meat was treated with basil leaves at various concentrations, namely 0%, 10%, 15%, and 20%. The data were analyzed using analysis of variance based on a completely randomized design with 4 treatments and 4 replicates. The variables observed in the physicochemical test included tensile strength, yield, pH, and moisture content. The results showed that the addition of basil leaves to dendeng had a significant effect ($p < 0.05$) on the physicochemical properties of dendeng. It was concluded that basil leaves could reduce tensile strength, yield, and moisture content, and affect pH.

Keyword: Basil leaf, Dendeng, Physicochemical properties, Rejected laying hens meat, Tensile strength



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1. Introduction

Spent laying hens are laying hens that are no longer productive for laying eggs due to their old age. Spent laying hens are used by farmers as broiler chickens. However, the meat quality of spent laying hens is lower than that of broiler chickens. Spent laying hen meat has disadvantages, namely its tough texture and unpleasant taste, making it less desirable to some consumers [1]. So it need innovative processed such as become dendeng. Dendeng is a processed meat product made from beef, buffalo, sheep, goat, spent laying hens, and other types of beef that is popular and has a distinctive aroma. Dendeng is processed by slicing or shredding the meat into specific sizes [2]. During processing, spices can be added to the dendeng, which is then dried in the sun and served [3]. Basil plays an important role in the processing of dendeng because the compounds in basil can help reduce the water content in meat. Damage to food products occurs due to humid storage and increased water content, which provides an opportunity for microorganisms to grow and multiply rapidly [4].

2. Method.

2.1. Time and place of research

This research was conducted from January 25 to February 19, 2024, at the Animal Production Technology Laboratory, Faculty of Animal Husbandry, Halu Oleo University, Kendari.

2.2. Research Materials

Material

The main raw materials used in this study were 400 grams of chicken meat, 550 ml of basil extract, 13 grams of garlic, 11 grams of shallots, 1 gram of galangal, 1 gram of ginger, 1 gram of salt, 1 gram of flavoring, 2 grams of pepper, 2 grams of coriander, and 8 grams of brown sugar, which were peeled and blended using a blender. All ingredients in this study were obtained from traditional markets in Kendari City.

Tool

The equipment used in this study included spoons, blenders, digital scales, knives, trays, plastic wrap, large bowls, ovens, pH meters, desiccators, crushers, porcelain dishes, analytical balances, and 105°C ovens.

Research design

This study was conducted using a completely randomized design (CRD) with 4 treatments and 4 replicates, as follows:

- P0: 0% Addition of Basil Leaves
- P2: 10% Addition of Basil Leaves
- P3: 15% Addition of Basil Leaves
- P4: 20% Addition of Basil Leaves

The mathematical model used For design study This is as following :

$$Y_{ij} = \mu + \alpha_i + \varepsilon_{ij}$$

Y_{ij} = Response treatment to i ($i = 1, 2, 3, 4$) on repeat to $-j$ ($j = 1, 2, 3, 4$)

μ = General average

α_i = Influence treatment i

ε_{ij} = error in treatment i th and repetition to $-j$

Research variable

Research variables include physicochemical quality testing with physical quality sub-parameters covering yield and tensile strength, as well as chemical quality parameters covering pH and moisture content.

Data analysis

The data obtained were analyzed using a completely randomized design (CRD). Furthermore, if the treatment showed a significant effect, it was followed by a Duncan test using SPSS Version 26 software.

3. Result and Discussion.

3.1. Physical Properties

3.1.1. Tensile strength of Dendeng

Tensile strength testing is a testing process to evaluate the strength or durability of a particular material against applied tension or pressure until it breaks or separates. The tensile strength values for chicken dendeng can be seen in Table 4.1 as follows:

Table 1. Average value tensile strength (Kg/cm^2) of Dendeng from spent hen laying meat with addition leaf different basil

Treatment (%)				
Test	P0	P1	P2	P3
U1	7.77	5.62	3.75	4.02
U2	4.82	4.55	2.41	1.07
U3	6.16	2.68	0.08	2.41
U4	4.55	6.61	1.87	2.41
Rataan	5.82^b ± 1.47	4.75^b ± 1.53	2.21^a ± 1.22	2.47^a ± 1.20

Information : Different superscripts on the same line show significant difference ($P < 0.05$). P0 (0% leaves basil), P1 (10% leaves basil), P2 (15% leaves basil), P3 (20% leaves basil).

The average results of physical tests on the tensile strength of spent laying hen meat with the addition of basil leaves (*Ocimum basilicum* L) (Table 3.1) show that the average treatment without the addition of basil leaves 0% (P0) is higher, namely (5.82), and the lowest is P2, namely (2.21). The average value in this study was in the range of 2.21-5.82, indicating that the tensile strength of spent laying hen meat had a low or insignificant value, where P0 was significantly different from P2 and P3, indicating that the addition of 15% and 20% had a significant effect. [5] states that very tender meat has a tensile force of $< 3.30 \text{ kg/cm}^2$, soft meat has a tensile force of $3.30 \text{ kg/cm}^2 - 5.00 \text{ kg/cm}^2$, slightly soft meat has a tensile force of $5.00 - 6.71 \text{ kg/cm}^2$.

2, slightly tough meat has a tensile force of 6.71–8.42 kg/cm², tough meat has a tensile force of 8.42–10.12 kg/cm², and very tough meat has a tensile force of >10.12 kg/cm² [6].

3.1.2 . Rendement

Rendement of dendeng was measured the amount of dendeng produced from the amount of raw dough used in the process. The results can be expressed in various forms, for example, the weight of dendeng produced as a percentage of the weight of raw meat used.

Table 2. Average value yield (%) in Dendeng chicken laying reject with addition different % of basil Leaf

Test	Treatment (%)			
	P0	P1	P2	P3
U1	87.00	75.00	70.00	68.50
U2	85.00	75.00	69.00	70.50
U3	90.50	71.00	68.50	67.50
U4	85.00	74.00	68.50	68.00
To the track	86.87^c ± 2.59	73.75^b ± 1.89	69.00^a ± 0.70	68.62^a ± 7.79

Information : Different superscripts on the same line show significant difference ($P < 0.05$). P0 (0% leaves basil), P1 (10 % leaves basil), P2 (15% leaves basil), P3 (20% leaves basil).

The average results of physical tests on the rendement of dendeng rejected laying hen meat with the addition of basil leaves (*Ocimum basilicum* L) (Table 2) show that the average treatment without the addition of basil leaves 0% (P0) is higher, namely (86.87), and the lowest is P3, namely (68.62). This average value indicates that the yield of rejected layer chicken jerky in this study ranged from 68.62 to 86.87. This shows that P0 is different from P1, P2, and P3, indicating that the addition of 10%, 15%, and 20% had a significant effect. The results of the analysis of variance show that the addition of basil leaves has a significant effect ($P < 0.05$) on the rendement of dendeng. The more basil leaves added, the lower the dendeng rendement produced. This decrease in rendement occurs because the flavonoid content in basil can reduce the water content and the drying process of the material, and the water content decreases during the drying process. This is in accordance with the opinion [7,8] which states that the flavonoid compound content in basil can reduce the water content during the processing, so that the decrease in water content results in a decrease in the percentage of rendement.

3.2. Chemical Properties

3.2.1. Dendeng Water Content

Water content testing determines the percentage of internal moisture content in dendeng produced in the laboratory. High water content can cause damage or spoilage to dendeng [9,10] if not store properly.

Table 3. Average total water content test (%) in dendeng chicken laying reject with addition different % of basil leaf

Test	Treatment (%)			
	P0	P1	P2	P3
U1	31.92	32.49	37.61	27.00
U2	36.11	37.45	38.53	20.11
U3	32.22	31.97	36.11	26.83
U4	33.49	31.85	27.11	24.71
Average	33.43^b ± 1.91	33.43^b ± 2.68	34.84^b ± 5.27	24.66^a ± 3.20

Note : Different superscripts on the same line show significant difference ($P < 0.05$). P0 (0% leaves basil), P1 (10 % leaves basil), P2 (15% leaves basil), P3 (20% leaves basil).

The average chemical test results for the water content of dendeng (Table 3) show that the average treatment with the addition of 15% basil leaves (P2) was higher (34.84) and the lowest was P3 (24.66). These average values indicate that the moisture content of discarded dendeng ranges from 24.66 to 34.84. This shows that P0 differs from P3, indicating that the addition of 20% basil leaves can have a significant effect on dendeng [11,12].

3.2.2. Dendeng pH

Table 4. Average total pH test on beef jerky chicken laying reject with addition leaf different basil

Test	Treatment (%)			
	P0	P1	P2	P3
U1	5.93	5.88	5.90	5.92
U2	5.91	5.86	5.90	5.90
U3	5,90	5,87	5,88	5,88
U4	5,91	5,87	5,89	5,90
Rataan	5,91^c ± 0,01	5,87^a ± 0,01	5,89^b ± 0,01	5,90^{bc} ± 0,01

Note : Different superscripts on the same line show significant difference ($P < 0.05$). P0 (0% leaves basil), P1 (10 % leaves basil), P2 (15% leaves basil), P3 (20% leaves basil).

The average chemical test results for the pH of dendeng with the addition of basil leaves (*Ocimum basilicum* L) (Table 4) show that the average treatment without the addition of basil leaves (P0) was higher at 5.91, and the lowest was P1 at 5.87. The average pH value of dendeng in this study ranged from 5.87 to 5.91. This indicates that P0 differs from P1, P2, and P3, suggesting that the addition of 10%, 15%, and 20% had a significant effect on dendeng [13, 14].

4. Conclusion

Giving leaf basil on dendeng increasingly on the physicochemical properties of dendeng, namely could reduce tensile strength, rendemenr, moisture content, and affect pH.

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